DIRECT SEEDING MULCH-BASED CROPPING SYSTEMS FOR RICE-BEEF PRODUCTION IN THE PLAIN OF JARS, XIENG KHOUANG PROVINCE, LAO PDR:

AN EXAMPLE OF THE "CREATION-VALIDATION" METHODOLOGICAL APPROACH

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CONTEXT

The Plain of Jars is an acid, infertile savannah grassland covering an area of about 60,000 ha in the western region of Xieng Khouang Province, northeastern Lao PDR. In this ecology, farming systems are mainly based on lowland rice cultivation and extensive livestock production. An increase in rice production and intensification of the livestock industry are two key components in the Lao government's poverty alleviation strategy for this area. The main agronomic constraints for developing crops and forage systems are related to serious unfavourable soil chemical characteristics. Low pH, along with nutrients deficiencies (in nitrogen, phosphorus, potassium, calcium and magnesium) and high levels of aluminium saturation probably have a negative effect on the growth of upland crops, as well as many pasture species.

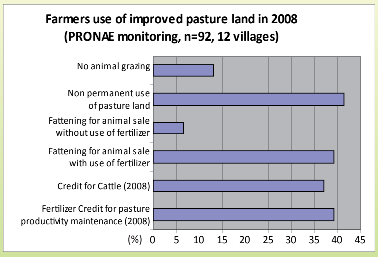
OBJECTIVES AND METHODS

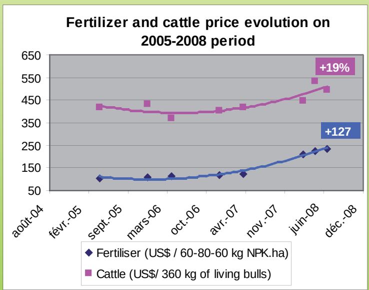
Since 2004, the Lao National Agro-Ecology Programme (PRONAE) has been working on innovative farming systems based on direct seeding mulch-based cropping system (DMC) principles, as a technical approach, and on the "creation-validation" methodology as a Research & Development (R&D) approach. The advantages of the methodology, whose specificity is a progressive in situ validation process with smallholders, are presented through the case of a DMC system developed in 2005 by the project to intensify rice-beef production in the Plain of Jars. The farming system initially proposed was a 5-year rotational sequence where improved pasture land was implemented in the first year, fattening activities conducted in the following three years and pasture regenerated in the fifth year using rice as a cash crop to finance pastureland re-implantation. Costs and benefits of the system were simulated according to the data collected in the creation sites. At the end of the 5 years, an average net income of 160 $US/year/ha and an average labour productivity of 2.5 US$ per ha and working day were expected. System was then proposed to 92 families forming 16 farmers groups in 12 different villages for an in situ validation covering 76 ha.

Costs & Benefits expected from Beef-rice 5-years farming system (for 1 ha plot)

Plot of 1 ha	1st year Pastureland implemen.	2nd year Bulls fattening	3rd year Bulls fattening	4th year Bulls fattening	5th year Pastureland re-implem (rice+forage)
COSTS (US $)	**240**	**765**	**803**	**842**	**303**
Plot fencing and designing	nd	nd	nd	nd	nd
Pastureland implementation	100	0	0	0	140
Fertilizer	120	125	132	139	146
Animals & animals care	0	615	645	675	0
Credit requirement	220	420	440	470	286
Credit interest	20	25	26	28	17
LABOUR (md.ha-1)	**68**	**72**	**62**	**62**	**55**
Fencing & Fence maintenance	30	20	10	10	10
Crops implementation and management	8	2	2	2	10
Seeds harvesting	30	0	0	0	35
Bulls management	0	50	50	50	0
BENEFITS (US $)					
Bulls sale	0	1000	1050	1100	0
Seeds production	210	0	0	0	395
GROSS INCOME (US $)	**210**	**1000**	**1050**	**1100**	**395**
NET INCOME (US $)	**-30**	**235**	**247**	**258**	**92**
LABOUR PRODUCTIVITY (US $/ wd)	**-0,44**	**3,26**	**3,98**	**4,16**	**1,67**

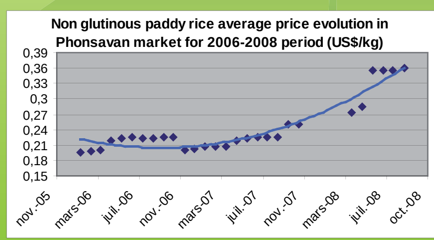
RESULTS AND DISCUSSIONS





Even though promising results have been described at the creation site, 3-years of continuous validation have revealed several constraints for mass extension. In-field monitoring and interviews with farmers showed the main constraints in the first year of improved pastureland implementation to be: (i) the forage seeds yield required to cover implementation costs and forage seed market limitations, (ii) fencing costs and (iii) the technical skills required for good-quality pastureland implementation. The main constraints for fattening activities and improved pastureland maintenance in the following years were (i) unequal inflation rates between inputs and outputs, (ii) fence maintenance, (iii) cattle market access malfunctioning and (iv) credit access, amount and payment modalities.

This feedback has given rise to development-related discussions and proposals regarding credit access, market channel functioning and training supports to be provided to farmers. This feed back has also given rise to new research topics, such as (i) how to reduce fertilizer use (main production cost) and (ii) how to generate higher incomes during the first year of implementation. New farming systems based on direct sowing of rice associated with forage species on degraded native pastureland have therefore been tested at creation sites and are currently under validation with farmer groups.



CONCLUSION

This rice-beef system "creation-validation" process shows (i) the need to maintain research activities in the development process and (ii) the merits of the "creation site / farmer validation group" system for determining the potential for technology dissemination.

Contact

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